



Ebola Virus Disease Outbreak West Africa 2014

**Rita Helfand, M.D.
Centers for Disease Control
and Prevention**

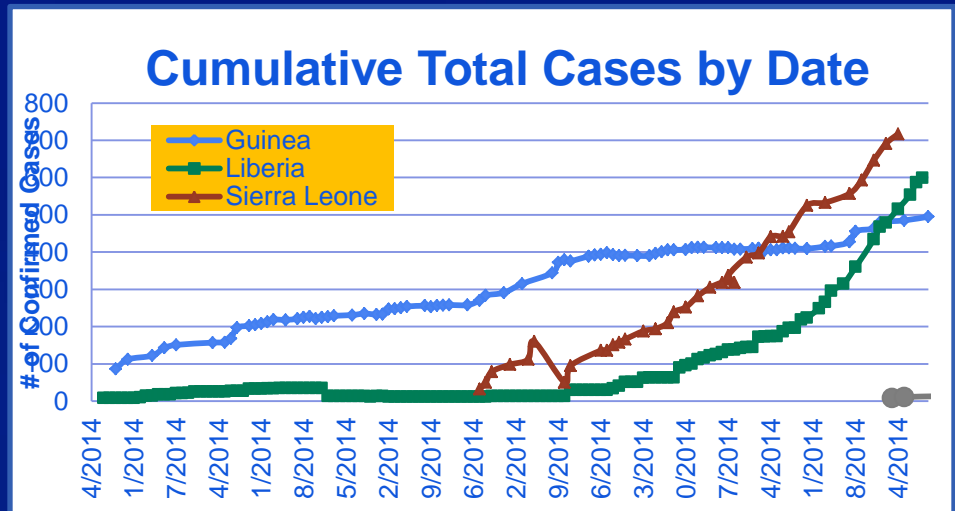
National Vaccine Advisory
Committee Meeting

September 9, 2014



2014 Ebola Outbreak, West Africa

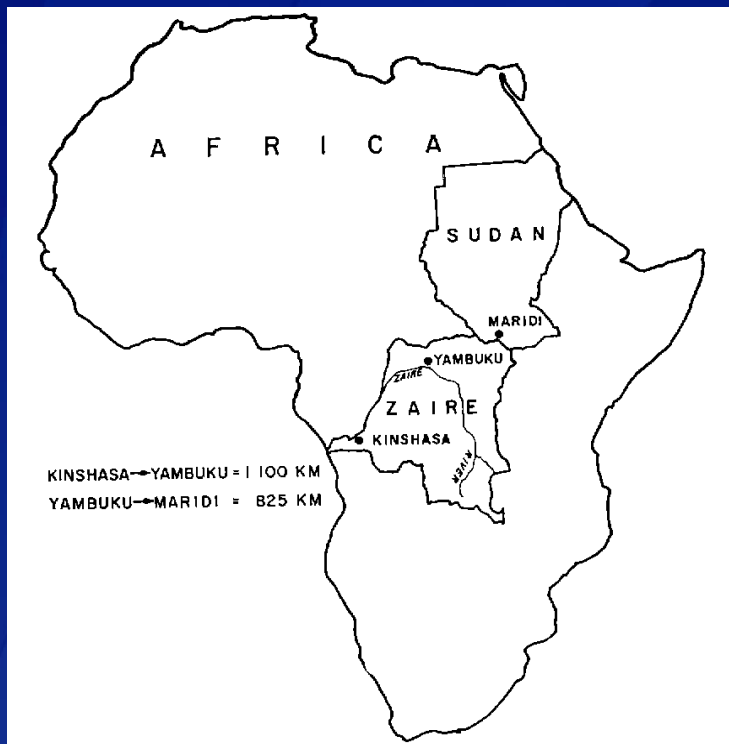
- ❑ Largest in history
- ❑ First in West Africa
- ❑ Outbreak in West Africa is worsening



BACKGROUND

Ebola Virus

Family of zoonotic RNA viruses: Filoviridae

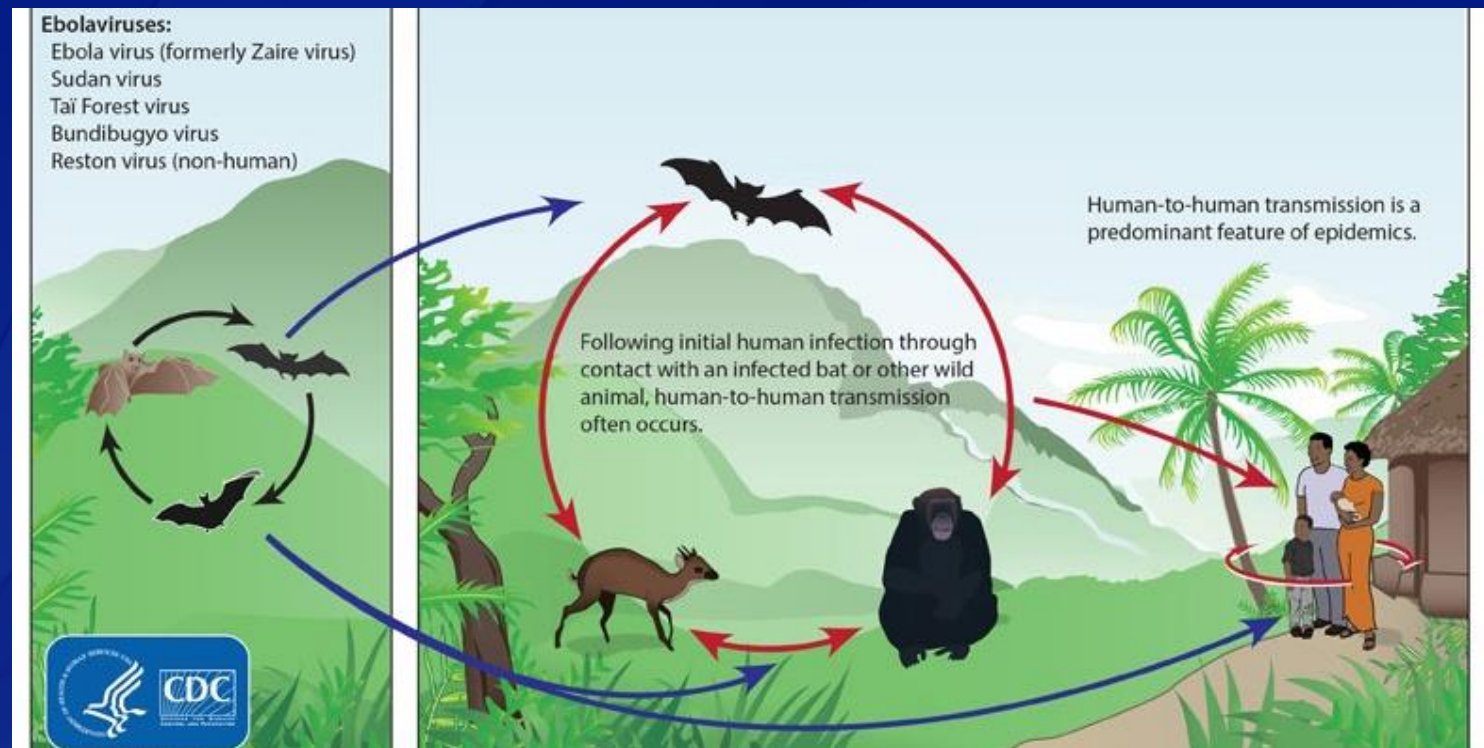


First discovery of Ebola virus

- In 1976
- Near the Ebola River in the Democratic Republic of the Congo
- Outbreaks have appeared sporadically since discovery

Ebola Virus

- ❑ Rare and deadly disease
- ❑ Caused by infection with one of the Ebola virus strains: Zaire, Sudan, Bundibugyo, or Tai Forest virus
- ❑ Animal-borne, with bats being the most likely reservoir

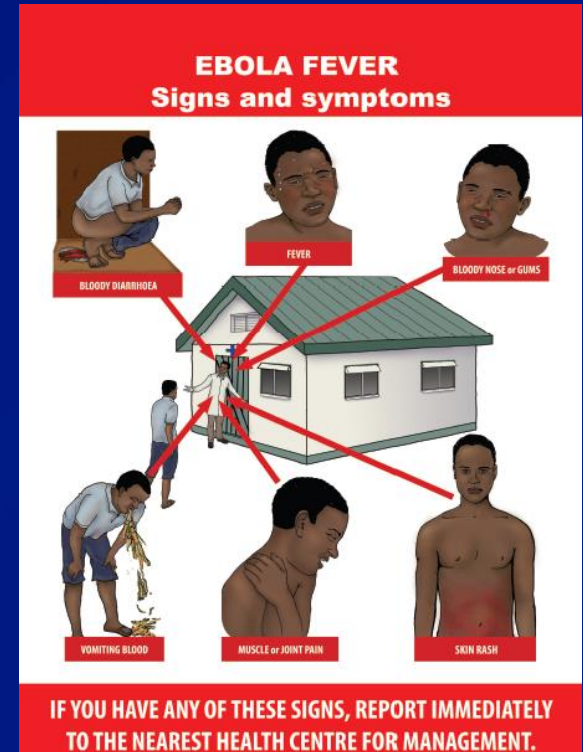


Transmission

- ❑ Ebola is spread through **direct contact** (through broken skin or unprotected mucous membranes) with a sick person's **blood or body fluids**, such as urine, saliva, feces, vomit, and semen.
- ❑ It is also spread through contact with **contaminated objects** (like syringes) or **infected animals**, for example, through handling of bushmeat.

Symptoms

- ❑ Signs of Ebola include fever greater than 38.6°C or 101.5°F and additional symptoms:
 - Severe headache
 - Muscle pain
 - Vomiting
 - Diarrhea
 - Abdominal pain
 - Unexplained hemorrhage (bleeding or bruising)
- ❑ The incubation period, from exposure to when signs or symptoms appear, ranges from 2 to 21 days, with an average of 8 to 10 days.
 - A person with Ebola virus is **not** contagious until symptoms appear



Treatment

- ❑ No licensed vaccine or medicine
- ❑ Treating symptoms as they appear:
 - Providing intravenous fluids and balancing electrolytes
 - Maintaining oxygen status and blood pressure
 - Treating other infections if they occur



CURRENT SITUATION

Ebola Outbreak West Africa

- ❑ On August 8, the World Health Organization (WHO) declared that the current Ebola outbreak is a Public Health Emergency of International Concern (PHEIC).
 - Need for a coordinated international response

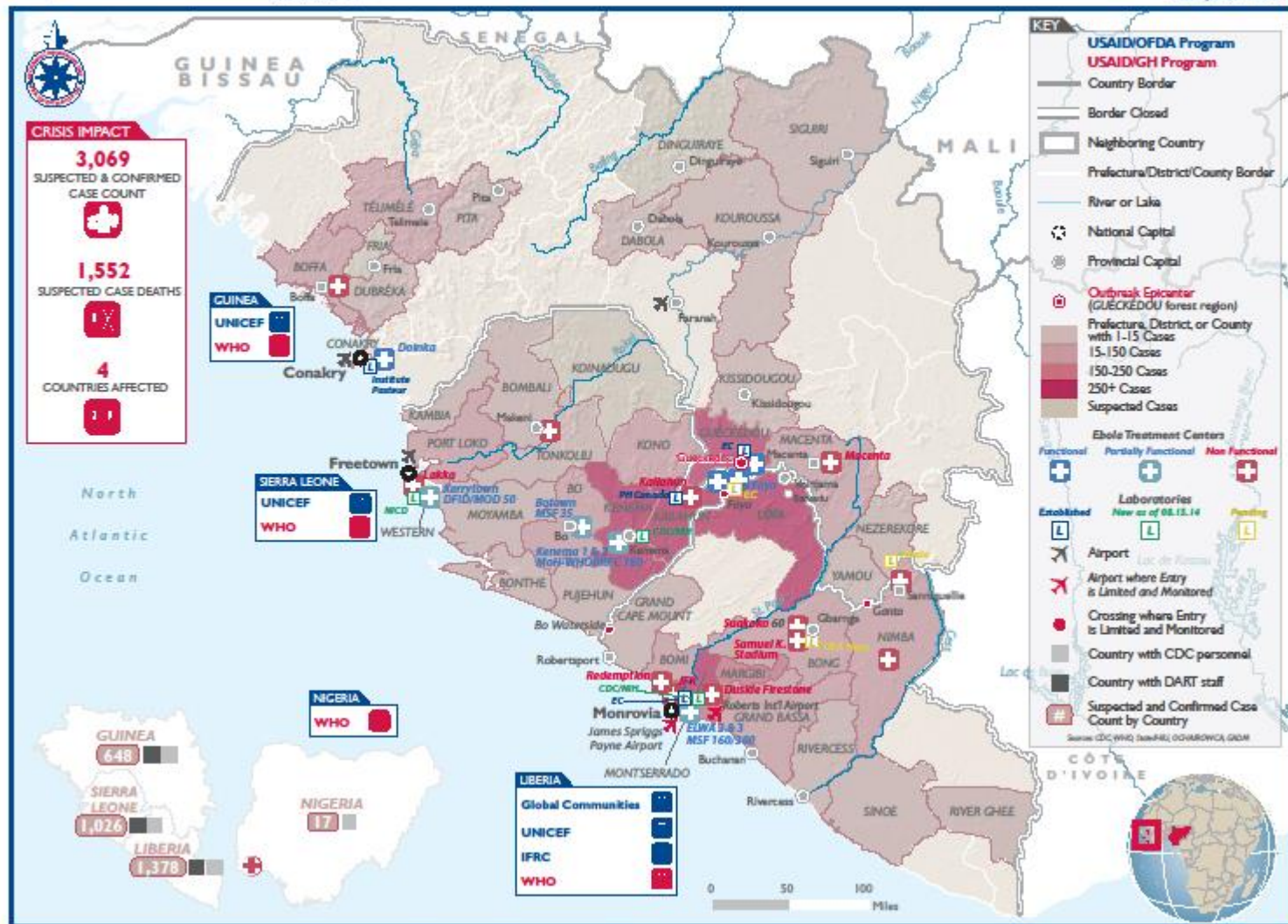




As of August
14, 2014

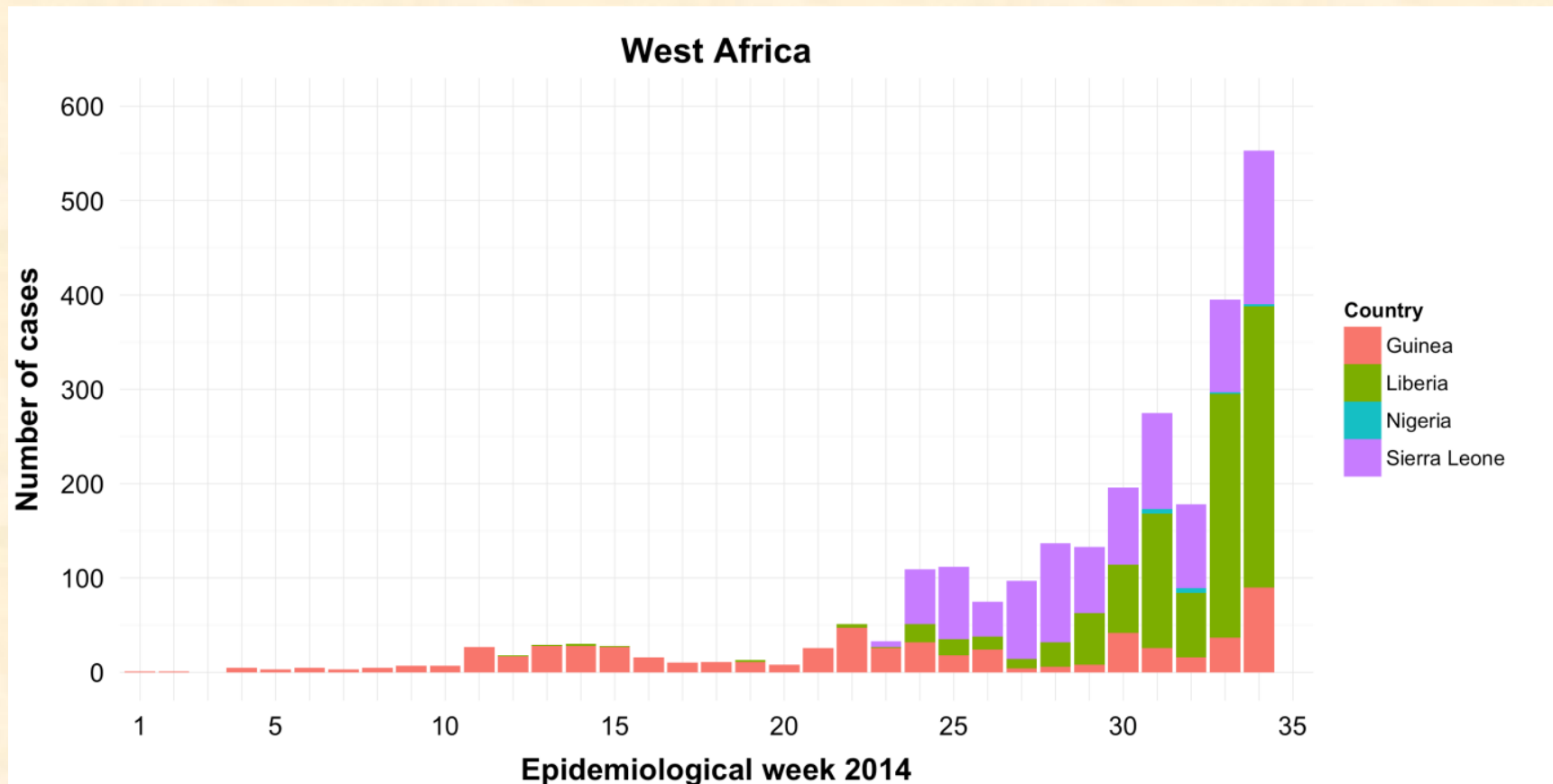
USG PROGRAMS FOR EBOLA OUTBREAK IN WEST AFRICA

Last Updated 09/03/14



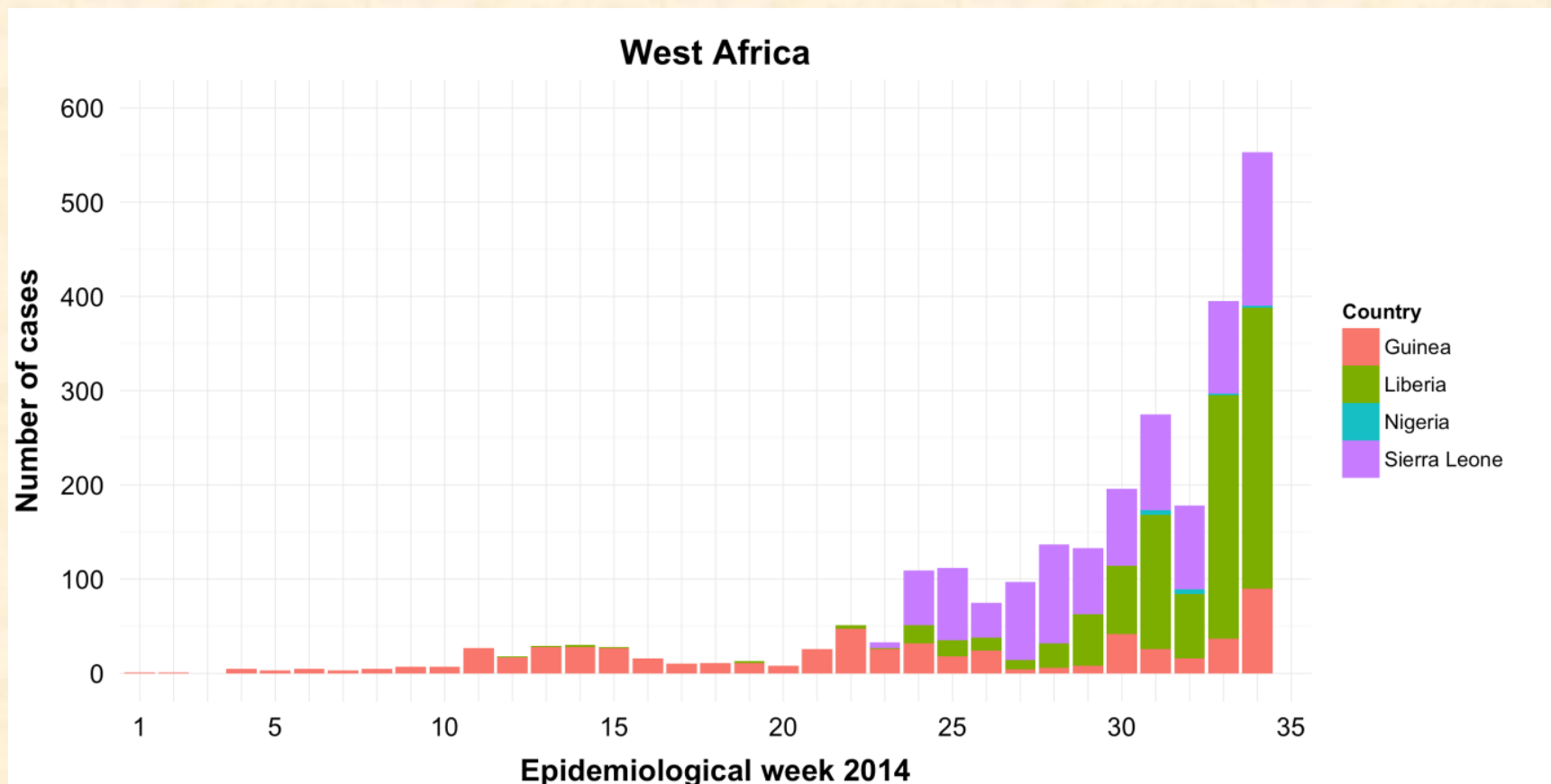
The boundaries, names, and data used on this map do not imply official endorsement or acceptance by the U.S. Government.

Cases by Week, January 2014 through August 25, 2014

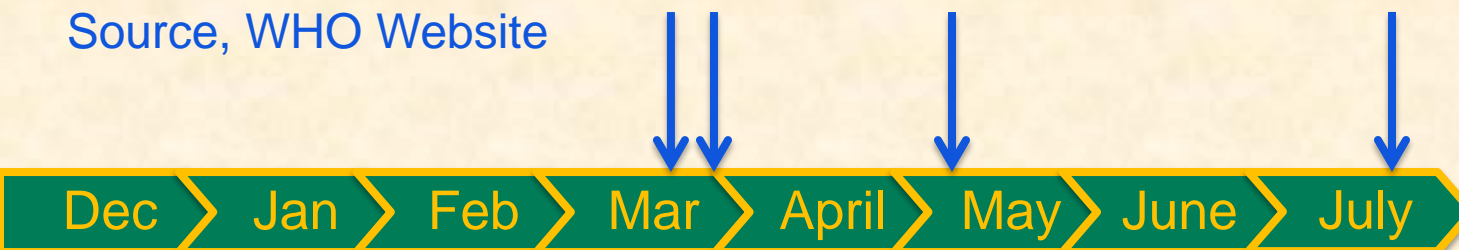


Source, WHO Website

Cases by Week, January 2014 through August 25, 2014



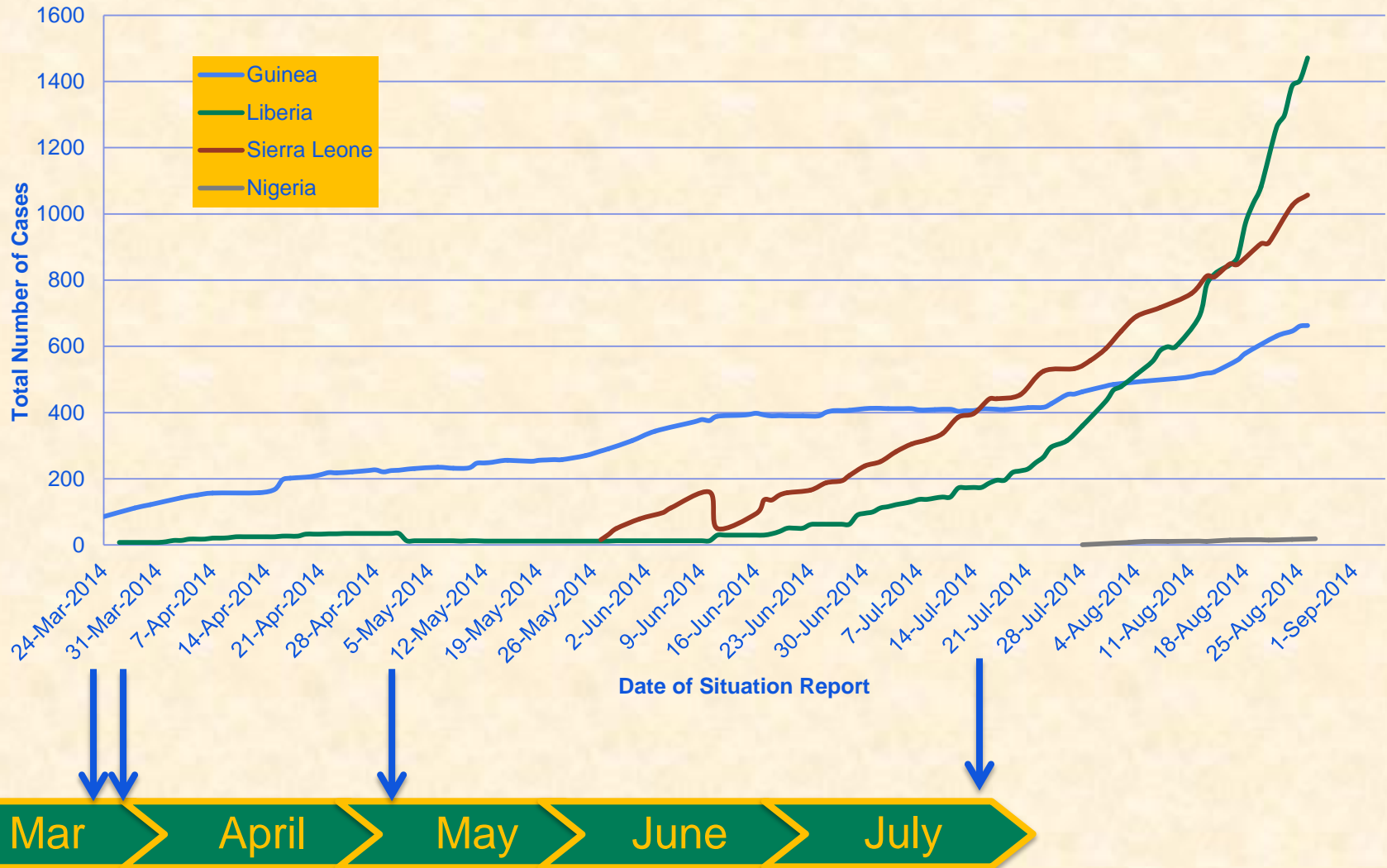
Source, WHO Website



Not exact correlation with graph above

630-395-0219

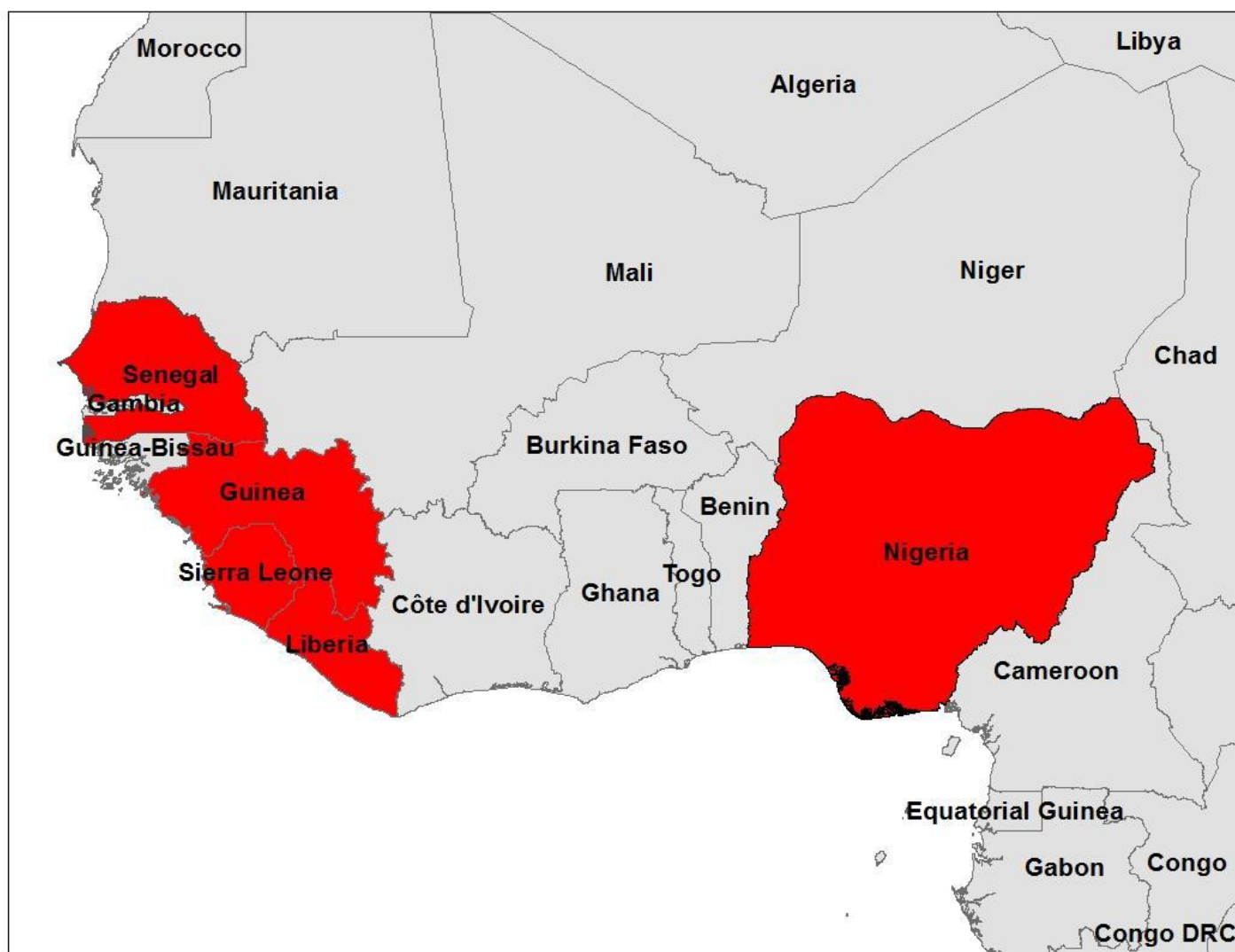
Total Number of Cases by Date of Situation Report— Guinea, Liberia, Sierra Leone, & Nigeria, Mar 24–Aug 29, 2014



Ebola Cases and Deaths (West Africa)

- ❑ **As of September 5, a total of 3967 suspected and confirmed cases of Ebola and 2105 deaths have been reported**
 - Guinea reported 812 cases, including 517 fatalities
 - Sierra Leone reported 1261 cases, including 491 fatalities
 - Liberia reported 1871 cases, including 1089 fatalities
 - Nigeria reported 22 cases, including 8 fatalities
 - Senegal has reported 1 case
 - As of Aug 25, > 240 healthcare workers infected, >120 fatalities
 - 45% of cases occurred in preceding 21 days!
- ❑ 24 August, the Democratic Republic of the Congo reported an unrelated Ebola outbreak

Countries with Confirmed Ebola Infections, W Africa, as of September 2, 2014



Ebola Cases (United States)

- ❑ **As of August 27, no confirmed Ebola cases have been reported in the United States.**
 - In 2014, two U.S. healthcare workers who were infected in Liberia were transported to a hospital in the United States.
 - Both patients have been released from the hospital after testing confirmed that they no longer have Ebola virus in their blood.
 - Other persons under investigation in the United States have all tested negative for Ebola.

CDC'S RESPONSE

Overall Goals in Outbreak Response: CDC Contribution

❑ Patient Care

- Experienced and/or trained staff
- Strict use of personal protective equipment (PPE)
- Physically and emotionally strenuous conditions

❑ Stop human-to-human transmission

- Case identification
- Contact tracing
- Infection control
- Risk factor identification and mitigation
 - Healthcare worker protection
 - Funeral and burial safe practices

❑ Prevent spread to other countries

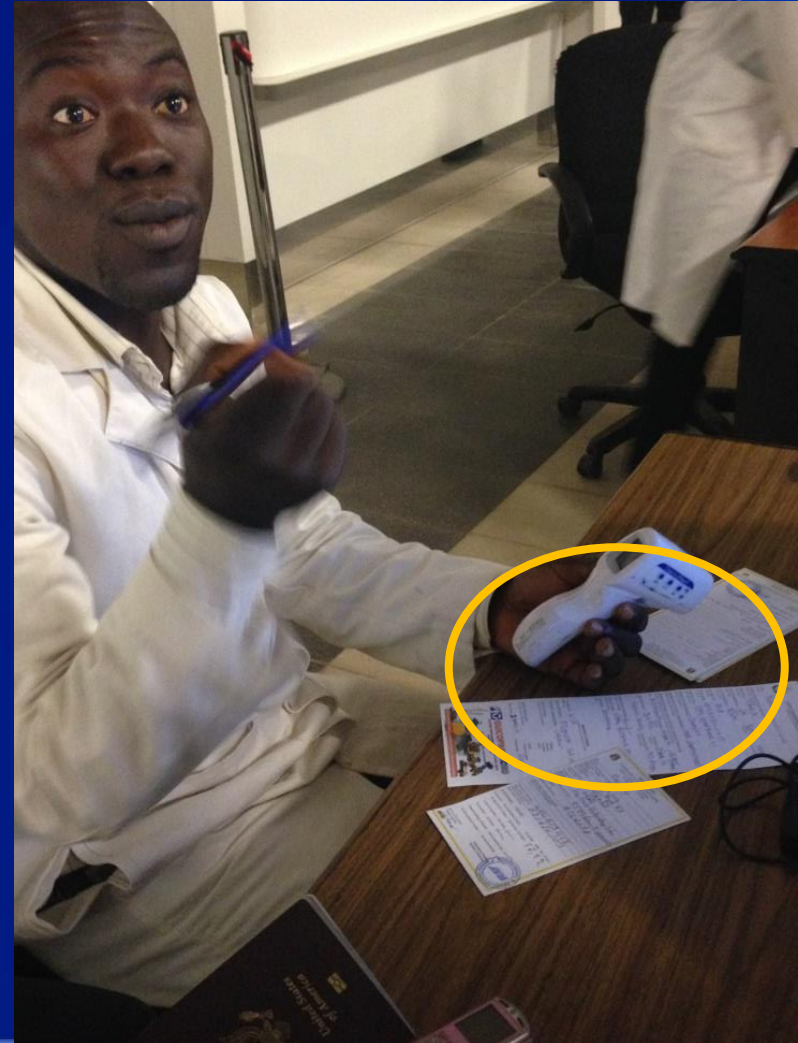
❑ Community education

- Fact sheets, health posters, pamphlets, radio spots videos in local languages



Case Identification

- ❑ **Healthcare workers**
 - Healthcare facilities
 - Active surveillance
 - E.g., Exit screening, Conakry airport
 - Contact tracing
 - Case investigation
- ❑ **Patients**
 - Self-presentation
- ❑ **Community Leaders**
 - Priest
- ❑ **General public**



Contact Tracing

- ❑ **Ask cases for list of contacts during illness**
 - Identifies those at risk of infection
- ❑ **Healthcare workers visit each contact daily**
 - During entire 21-day incubation period
 - Signs and symptoms
- ❑ **Identifies cases as soon as possible**
- ❑ **Encourages leaving community to enter Ebola treatment center**

Infection Control

- ❑ **Placement of cases in Ebola treatment centers**
- ❑ **Disinfection of homes through spraying and burning**
- ❑ **Corpse removal and secure burial**
 - Special teams with PPE
- ❑ **Education and provision of PPE to healthcare workers**
 - Both Ebola and non-Ebola treatment units





Risk Identification and Mitigation

- ❑ **Healthcare worker protection**
- ❑ **Funeral and burial safe practices**

What CDC is Doing in West Africa

- ❑ **CDC has activated its Emergency Operations Center (EOC) for coordination of efforts**
 - Participation from other Gov't agencies
 - E.g., FDA, DoD, DoS, DHS, USAID, HHS, ASPR
- ❑ **Several CDC teams of public health experts have been deployed to West Africa**
 - Approximately 500 CDC staff members
 - As of September 9, around 100 staff currently deployed
 - deployed
 - Providing technical assistance
 - Deployed field laboratories
 - Working with USAID “DART” Teams*
 - As of August 22, eight health communicators are deployed
 - CDC is working with airlines, airports, and ministries of health to provide technical assistance for the development of exit screening and travel restrictions in the affected areas
 - Infection control training
 - Assisting with data management
- ❑ **Working with CDC-Foundation to procure necessary supplies**



International Assistance Team – Sierra Leone



Airport Health personnel trained on Ebola screening

By Poindexter Sama

The devastating effect of Ebola on the aviation industry since its outbreak in May this year has caused a training session for aviation operatives on primary and secondary screening procedures for the Ebola disease among passengers at departure and arrival lounges. On Friday, stakeholders at the Sierra Leone Airports Authority in partnership with the Civil Aviation Authority and the United States Centre for Disease Control, facilitated a convergence of airport health officials at the conference room of Helipad to explain the dynamics of the deadly Ebola virus and how to technically screen passengers coming in and going out of the country.

At least 20 health officials including six medical doctors deployed at the airport have presently gone through a technical facilitation of experts from the U.S Centre for Disease Control, (CDC) Dr. Kathrin Kohl and Jennifer Brooks on the Ebola viral disease.

During the opening ceremony, the Board Chairman of Sierra Leone Civil Aviation Authority, Capt. V.E.O. Spaine considered the Ebola outbreak as the first "biological terrorism which needs to be addressed due to the adverse effect it has had on the operation of airlines and the spill-over economic implications it has landed the country.

He said that the training is important because it will restore confidence in flight operatives, and prove to the international world that the airport has standard mechanisms

in place that will be able to track down passengers who might knowingly or unknowingly be in possession of the Ebola virus.

The General Manager of Sierra Leone Airports Authority, John Sesay said that the aviation industry was opportuned to have benefitted from a free offer of expertise from the U.S. disease experts to train staff on screening procedures. For this reason, he said, the airport has installed multiple handheld infrared thermometers and advanced thermal cameras at both departure and arrival lounges to screen passengers.

The Director-General of Civil Aviation Authority, Abubakarr Kamara said that part of the requirement of the International Civil Aviation Organisation is to keep the Lungi Airport in tune with international aviation standards, and that they as members of the organisation are very proactive in making sure that such a demand is achieved.

Following the outbreak of the Ebola disease, he said, the aviation industry has suffered a great deal in not only income generation but the negative effect it has had on state's activities abroad.

At the moment, he revealed, the airport only operates with three flights; SM Brussels, Air France and Royal Air Maroc, while the rest have cancelled their operations.

Therefore, the DG assured, the training on passenger screening was very paramount, as it will restore confidence in the operation of the remaining airlines in the area of passenger safety and the safety of their respective countries of origin.

What CDC is Doing in the US

- ❑ **Preparedness activities**
- ❑ **Working to educate American healthcare workers**
 - How to isolate patients and how to protect themselves from infections
 - Developing guidance for U.S. healthcare providers
- ❑ **Communication and social media**
 - Updating CDC webpages
 - Sharing fact-based information and to dispel misconceptions about Ebola
- ❑ **Working with state and local public health and laboratory partners, airports, other USG agencies**

CHALLENGES

Outbreak Challenges, West Africa

- ❑ Porous borders
- ❑ High population mobility
- ❑ Geographic breadth



Outbreak Challenges, West Africa

❑ Overburdened public health and healthcare system

- Unpaid healthcare workers
- Insufficient numbers of treatment centers/bed
- Insufficient quantities of PPE
- Insufficient medical supplies



❑ Inefficient stakeholder utilization

- Backlog of data cleaning and entry
- Need for complete data
- Need to report suspect cases instead of waiting for lab confirmation

❑ Typical outbreak issues

Outbreak Challenges: Lack of Acceptance of EVD

- ❑ Not surmounted by education
- ❑ Fear and superstition
 - Health posters
- ❑ Stigma
 - Needing negative results to return to work
- ❑ Distrust of outsiders
 - Brought Ebola to make money
- ❑ Role of war exposure



Opportunities

- ❑ Strong political commitment in affected countries
- ❑ Trained local staff (e.g., MSF)
- ❑ Examples of successful control
- ❑ According to WHO, 80% of cases occurring in 9/42 counties in three widely affected countries

Conclusions

- ❑ **Largest and most complex Ebola outbreak to date**
- ❑ **Incomplete control measures have permitted human to human transmission**
 - Geographic breadth, porous borders, population mobility contribute to difficulties
 - Hampered by lack of cooperation between communities and response partners
- ❑ **Ebola outbreaks can be terminated through appropriate control measures**
- ❑ **Risk to U.S. minimal**

Conclusion - 2

- ❑ **We have a window of opportunity to control the outbreak, but time urgency**
- ❑ **This outbreak will likely get worse in coming weeks**
- ❑ **We are in an interconnected world**
 - Risk of importations to other countries will continue until the outbreak is controlled
- ❑ **A global coordinated response is necessary**

Conclusion - 3

- **“The bottom line with Ebola is we know how to stop it: traditional public health. Find patients, isolate and care for them; find their contacts; educate people; and strictly follow infection control in hospitals. Do those things with meticulous care and Ebola goes away.”**

-Tom Frieden, MD, MPH

Director of the Centers for Disease Control and Prevention

Thank you

